

IN THE CLAIMS:

Please amend the claims as follows:

1. (currently amended) A method for establishing a data transfer link between an xDSL user modem and a xDSL modem within a central office wherein the xDSL modem within the central office comprises:

demodulating means for demodulating a received analog pulse length modulated signal;

storing means for storing a wake-up bit pattern which identifies the xDSL user modem;

comparing means for comparing the demodulated received signal with the stored wake-up bit pattern; and

wake-up command generating means for generating a wake-up command to switch the xDSL modem within the central office from the sleep mode to the operation mode, when the demodulated received signal is identical with the stored wake-up bit pattern;

wherein the demodulating means of the xDSL modem within the central office comprises a gain sequencer for amplifying the received analog signal with an adjustable gain;

rectifying means for rectifying the amplified signal;

a low-pass filter for filtering the rectified signal; and

a comparator for comparing the filtered signal with an adjustable threshold generating an asynchronous pulse train which is supplied to the comparing means within a central office comprising the following steps:

(a) generating a wake-up bit pattern identifying the user xDSL modem;

(b) pulse length modulating an upstream data signal with the generated wake-up bit pattern to generate a pulse length modulated wake-up signal;

(c) transmitting the pulse length modulated wake-up signal from the user xDSL modem via a data transfer medium to the xDSL modem within the central office;

wherein the xDSL modem within the central office performs the following steps

(d) demodulating the transmitted wake-up signal;

(e) comparing the demodulated wake-up signal with a stored wake-up bit pattern for the detection of a transmission of the wake-up bit pattern from the xDSL user modem;

(f) generating a wake-up command signal, when the wake-up bit pattern is detected for

switching the xDSL modem within the central office from a sleep mode to an operation mode for data transfer.

2. (currently amended) The method according to claim 1, wherein the xDSL modem within the central office commences a start-up procedure when it is switched to the operation mode.

3. (currently amended) The method according to claim 1, wherein the wake-up signal is transmitted periodically by the xDSL user modem.

4. (currently amended) The method according to claim 1, wherein the xDSL modem within the central office is switched from the operation mode to the sleep mode when the data transfer is finished.

5. (currently amended) The method according to claim 1, wherein a detection counter is incremented when the wake-up bit pattern is detected.

6. (currently amended) The method according to claim 5, wherein the wake-up command signal is generated when the detection counter reaches a threshold value.

7. (original) The method according to claim 6, wherein the threshold value is adjusted.

8. (currently amended) An xDSL data transfer system for data transfer comprising at least one xDSL user modem connected via a data transfer medium to a corresponding xDSL modem within a central office; said xDSL user modem comprising

demodulating means for demodulating a received analog pulse length modulated signal;
wherein the demodulating means of the xDSL user modem comprises a gain sequencer for amplifying the received analog signal with an adjustable gain;

rectifying means for rectifying the amplified signal;

a low-pass filter for filtering the rectified signal; and

a comparator for comparing the filtered signal with an adjustable threshold generating an asynchronous pulse train which is supplied to a bit pattern comparing means;

storing means for storing a wake-up bit pattern which identifies a corresponding xDSL user

modem;

the bit pattern comparing means capable of comparing the demodulated received signal with the stored wake-up bit pattern; and

wake-up command generating means for generating a wake-up command to switch the corresponding xDSL user modem from a sleep mode to an operation mode, when the demodulated received signal is identical with the stored wake-up bit pattern;

wherein the xDSL user modem generates a pulse length modulated wake-up signal for switching the corresponding xDSL modem within the central office from the sleep mode to the operation mode.

9. (currently amended) The xDSL data transfer system according to claim 8, wherein the xDSL user modem comprises generating means for generating a wake-up bit pattern identifying the xDSL user modem, and

modulating means for the pulse length modulation of an upstream data signal with the wake-up bit pattern to generate the pulse length modulated wake-up signal,

wherein the pulse length modulated wake-up signal has a spectrum within an xDSL upstream frequency band.

10. (currently amended) The xDSL data transfer system according to claim 9, wherein the generated wake-up bit pattern comprises 16 bits.

11. (currently amended) The xDSL data transfer system according to claim 9, wherein each bit of the wake-up bit pattern determines the duration of a pulse length of a pulse of the pulse length modulated wake-up signal.

Claims 12-14 (canceled)

15. (currently amended) The xDSL data transfer system according to claim 8, wherein the bit pattern comparing means comprises:

a synchronization means for synchronizing the asynchronous pulse train with an internal clock signal;

a pulse length detecting circuit for detecting a pulse length of each pulse in the synchronized

received pulse train and generating a logical bit value corresponding to the detected pulse length;
a register for temporarily storing a received bit pattern;
a comparator which compares the received bit pattern with the stored wake-up bit pattern and increments a counter when the received bit pattern and the stored wake-up bit pattern are identical.

16. (currently amended) The xDSL data transfer system according to claim 15, wherein the wake-up command generating means generates the wake-up command when the counter reaches an adjustable threshold value.

17. (currently amended) The xDSL data transfer system according to claim 8, wherein the xDSL user modem and corresponding xDSL user modem are VDSL modems.

18. (currently amended) The xDSL data transfer system according to claim 8, wherein the data transfer medium is a telephone line.

19. (currently amended) An xDSL modem comprising
a generating means for generating a wake-up bit pattern identifying the xDSL modem; and
modulating means for the pulse length modulation of an upstream xDSL data signal with the generated wake-up bit pattern to generate a pulse length modulated wake-up signal, wherein the pulse length modulated wake-up signal has a frequency range within the xDSL upstream frequency band,
and

wherein the xDSL modem comprises:

demodulating means for demodulating a received analog pulse length modulated signal;

storing means for storing a wake-up bit pattern which identifies a corresponding xDSL modem;

comparing means for comparing the demodulated received signal with the stored wake-up bit pattern; and

wake-up command generating means for generating a wake-up command to switch the xDSL modem from a sleep mode to a operation mode, when the demodulated received signal is identical with the stored wake-up bit pattern;

wherein the demodulating means of the xDSL modem comprises a gain sequencer for amplifying the received analog signal with an adjustable gain;

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rectifying means for rectifying the amplified signal;
a low-pass filter for filtering the rectified signal;
and a comparator for comparing the filtered signal with an adjustable threshold generating an asynchronous pulse train which is supplied to the comparing means.

Claim 20 (Canceled)

21. (new) An xDSL system comprising an xDSL modem within a central office wherein the xDSL modem comprises:

demodulating means for demodulating a received analog pulse length modulated signal;
storing means for storing a wake-up bit pattern which identifies a corresponding xDSL user modem;
comparing means for comparing a demodulated received signal with the stored wake-up bit pattern;
wake-up command generating means for generating a wake-up command to switch the xDSL modem from a sleep mode to an operation mode, when the demodulated received signal is identical with the stored wake-up bit pattern;
wherein the comparing means comprises
a synchronization means for synchronizing an asynchronous pulse train with an internal clock signal;
a pulse length detecting circuit for detecting a pulse length of each pulse in the synchronized pulse train and generating a logical bit value corresponding to the detected pulse length;
a register for temporarily storing a received bit pattern;
a comparator which compares the received bit pattern with the stored wake-up bit pattern and increments a counter, when the received bit pattern and the stored wake-up bit pattern are identical.